Economic Calculation and Constraints on Firm Size

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Abstract – It has long been recognized that the need for economic calculation places boundaries on firm size. Kirzner (1992) notes that, "In a free market, any advantages that may be derived from 'central planning' are purchased at the price of an enhanced knowledge problem. We may expect firms to spontaneously expand to the point where additional advantages of 'central' planning are just offset by the incremental knowledge difficulties that stem from dispersed information." Much of the existing work focuses on the costs of market exchange rather than the costs of monitoring internal exchange.

In this study, we examine the costs associated with a firm's internal exchange of capital. We argue that firms dependent upon the financial markets for infusions of capital are likely to curtail sub-optimal investment policies to maintain a positive reputation in the eyes of potential investors. Conversely, firms with the ability to finance their investment with internally generated capital bear the costs of avoiding this external oversight. Larger firms have significantly more cash flow available after investment and are consequently less reliant on the external markets. With high levels of free cash flow, the unconstrained manager can socialistically fund investment projects by choosing to invest both in positive and negative net present value projects. Thus, we anticipate the efficiency of resource allocation within a corporate internal capital market is decreasing with the coincident levels of free cash flow and with firm size.

Consistent with this view, we illustrate that the internal dependence on capital (and the associated costs) are indeed increasing in firm size. They are likewise increasing with the level of free cash flow available at the discretion of managers. We illustrate that these increased levels of free cash flow lead to suboptimal resource allocation in the form of cross-subsidizing and value-destroying investment activity, and ultimately to the deterioration of shareholder wealth. However, the free cash flow problem appears to be concentrated in mid-sized and large conglomerates which are less dependent on the external capital market. Smaller conglomerates funding investment with externally generated funds do not experience such deteriorations in wealth.

JEL classification: G31, G32, G34
Keywords: Diversification, Internal Capital Markets, Small Firms

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I. Introduction

The literature on conglomerates has excluded an important subset of the corporate universe. The existing research, although voluminous, has focused on large established firms and has almost completely omitted smaller diversified firms. This is due, in large part, to the success of Berger and Ofek (1995) (referred to as B&O95 hereafter). Since this work, researchers in corporate diversification and internal capital markets have almost exclusively relied on the B&O95 sample selection methodology which, among other things, requires that firms be of a certain size to avoid distorted valuation ratios when assets or sales are close to zero (see Table 1). While academics and practitioners alike have learned much from their pioneering work of B&O95 and the work of others that followed, we know almost nothing about the value impacts of diversification in smaller firms or how these firms manage their internal capital markets. The aim of this paper is to fill that gap in the literature.

Small firms are important to examine since they are a major source of innovation and are the future of tomorrow's economy. Acs and Audretsch (1988) emphasize the importance of small firms in the development of breakthrough innovations in mature industries dominated by large firms. Acs, Audretsch, and Feldman (1994) discuss possibilities where smaller firms might even have innovative advantages over their larger competitors. Small firms wield a hefty influence in today's economy as well. Acs and Audretsch (1988) also find that firms with less than five-hundred employees account for a majority of the total number of manufacturing firms as well as a significant fraction of the labor force and total sales. Gertler and Gilchrist (1994) demonstrate that smaller firms play a disproportionate role in the responses of manufacturing sales and inventory demand to monetary policy.

Using a sample of diversified firms from 1978-1997, I find that small firms (defined as less than or equal to $20 million in 1986 dollars) trade at a significant premium of 3.1% - 14.7%

relative to their larger counterparts. They do, however, still suffer from the "diversification discount" and have significantly negative excess values. I find little evidence that small diversified firms operate their internal capital markets any less efficiently than those in large diversified firms. I also find that smaller diversified firms are significantly more financially constrained than large diversified firms, and they access the external capital markets more frequently. Although the increased monitoring pressure of outside investors explains some of the higher excess valuations enjoyed by these firms, a large significant small firm premium remains after controlling for moderating effects such as size, levels of investment, information asymmetry, financial constraints, and significant customers.

The remainder of the paper is organized as follows. In Section II, I present a brief review of the diversification and internal capital markets literature and its implications for the value impact of diversification in smaller firms. In Sections III & IV, I discuss my sample selection and methodology. I present my results Section V and I conclude the paper in Section VI.

[Insert Table 1]

II. Hypothesis Development

Since Lang and Stulz (1994) and B&O95, the existing literature has repeatedly documented a "diversification discount" where multi-segment firms suffer from valuation multiples that are lower than those derived from a portfolio of their single-segment peers. Stein (1997) argues that multidivisional firms have the potential to create value relative to stand-alone firms by engaging in "winner-picking" among the firm's divisions when choosing where to allocate resources for future growth. In spite of this, Scharfstein and Stein (2000) and Bernardo, Luo, and Wang (2006) show that the rent-seeking behavior of division managers can subvert this value creation which results in the cross-subsidization of business units. The evidence put forth by B&O95 and Rajan, Servaes, and Zingales (2000) indicates that cross-subsidization does occur and that the subversion of corporate internal capital markets destroys value. While these effects are well documented in large

firms, the literature is silent as to whether these results are applicable to smaller firms who differ significantly from their larger cousins in many dimensions. For the first time in the literature, I examine in this paper whether or not these results still hold for smaller firms. While I expect that smaller firms should trade at a discount relative to a portfolio of single-segment firms, it is unclear whether the magnitude of this discount should be greater for smaller diversified firms than for larger ones.

There are several *a priori* reasons why a small diversified firm might trade at less of a discount than their larger competitors. Capital constraints may force smaller firms to reach outside the firm for financing more frequently. This would subject them to the monitoring forces of the external capital markets more often. This increased monitoring pressure might reduce the agency problems associated with managerial discretion identified by Jensen (1986) and Lang, Poulsen, and Stulz (1995) and could lead to relatively higher valuations.

> **H1:** Small diversified firms should trade at a premium relative to large diversified firms since they depend on the financial markets for capital and this external monitoring pressure mitigates agency issues associated with managerial discretion.

H1 predicts that proxies for use of external capital should increase firm value. The capital constraints faced by smaller firms may also lead to improved resource allocations and, consequently, increased valuations. To the extent that external monitoring pressures are able to restrain divisional managers by way of the headquarters unit, H1 also predicts that measures of internal capital market efficiency should be increasing in the use of external capital.

Alternatively, it is likely that smaller firms are geographically concentrated and divisional managers are more likely working in close contact with the CEO, the board of directors, and influential outside investors. Consequently, the rent-seeking behavior described in Scharfstein and Stein (2000) and Rajan *et al.* (2000) would be more observable, could likely be implicitly

contractible, and immediately disciplined. This should result in reduced agency problems between upper and middle management, increased efficiency in resource allocation, and higher valuations.

H2: Small diversified firms should trade at a premium relative to large diversified firms since the rent-seeking behavior of division managers is more observable which leads to improved resource allocations and excess values.

H2 predicts that both the efficiency of resource allocations and firm value should be decreasing in proxies of firm complexity.

There are also empirical regularities that could cause smaller diversified firms to trade at a deeper discount than larger diversified firms. Banz (1981) and Reinganum (1981) document that small firms yield higher expected returns than large firms. Chan and Chen (1991) argue that the excess returns attributable to small firms are due to higher degrees of financial leverage and low production efficiency while Stoll and Whaley (1983) attribute the abnormal returns to transaction costs associated with investing in these firms. Lamont and Polk (2001) discuss how the diversification discount and expected returns are mechanically related. Everything else being equal, higher expected returns should lead to lower valuations and a greater discount in an efficient market. Errunza and Senbet (1984) find evidence of the "size effect" for a sample of geographically diversified firms. During the 1970s, they find that large multinational corporations enjoy significantly higher valuations. Although the excess value measure utilized in this analysis controls for size, it is possible some other factor resident in the "size effect" of expected returns has not been accounted for and this factor could further depress valuation ratios.

H3: Small diversified firms should trade at a discount relative to large diversified firms due to the risk factors associated with the "small firm effect."

H3 predicts that firm value is increasing in size. If the "small firm effect" is due to risks associated with unproductive firms with high degrees of leverage, then firm value should be decreasing with total leverage and increasing with profitability, especially for small firms.

By nature of being small, it is likely that smaller firms will produce less information for investors and they likely have a smaller following in the analyst community or the financial press. Information asymmetry between managers and investors increases the costs of becoming informed and, as a result, investors could demand higher expected returns and a discounted valuation.

H4: Small diversified firms should trade at a discount relative to large diversified firms since they produce less information for the financial markets and suffer from higher levels of information asymmetry.

H4 predicts that firm value should be decreasing in proxies for information asymmetry, especially for small firms.

Small firms could also yield a greater discount due to inefficient resource allocation. Fazzari, Hubbard, and Petersen (1988) show that smaller firms are likely capitally constrained. As a result, they may be more prone to allocating resources to cash-rich divisions instead of those with the best growth opportunities to ensure their continued survival.

H5a: Small diversified firms should trade at a discount relative to large diversified firms due to capital constraints that promote inefficient resource allocations to business units that ensure the organizations future survival rather than to the business units with the best growth opportunities.

H5a predicts that the efficiency of the small diversified firm's internal capital market should be negatively impacted by the degree of financial constraints faced by the firm. Small diversified firms should shift resources towards cash-rich divisions in favor of high q divisions if these recipients are in conflict. By way of an inefficient internal capital market, H5 predicts that financial constraints should negatively impact firm value.

However, theoretical work by Matsusaka and Nanda (2002) argues that corporate internal capital markets only add value in the presence of costly external financing. Recent empirical

evidence by Hovakimian (2006) supports this notion and shows that internal capital markets efficiency is increasing in the degree of financial constraints.

H5b: Small diversified firms should trade at a premium relative to large diversified firms due to capital constraints that promote more efficient resource allocations to business units to avoid the use of costly external financing.

H5b predicts that the efficiency of the internal capital market should be an increasing function of the small diversified firm's financing constraints. The improve resource allocation should also result in improved excess valuations.

Furthermore, due to their small size, these firms are more likely to be at the mercy of large customers for product improvements or service enhancements. They may divert an inordinate amount of corporate resources to appease those customers that make up substantial portions of the firm's sales. Christensen and Bower (1996) present evidence of how powerful customers divert the resource allocation process in market leading firms away from innovative growth opportunities. They show that focusing exclusively on the largest customers' demands ultimately leads to the demise of their market leadership.

H6: Small diversified firms should trade at a discount relative to large diversified firms due to the demands of large customers that manipulate managers to engage in inefficient resource allocations that serve the interests of the large customers in favor of future growth.

H6 predicts that internal capital market efficiency will be decreasing in the percentage of sales composed of by large customers. This should serve to lower firm valuations as well.

III. Data

Sample Selection

The initial sample consists of the universe of multi-segment firms listed in the COMPUSTAT industrial annual and business-segment databases from 1978-1997. In 1998, FASB

implemented SAS 131 which changed the way firms report segment data. The direct comparability of pre- and post-1998 segment data is compromised by this FASB rule and it is the reason for the termination date of the sample. I require that each firm has data on market value of equity, book value of assets and equity, net sales, and deferred taxes. I further require that each business segment possess data on assets, sales, profit, and capital expenditures. As in B&O95, I exclude all financials (SIC codes 6000-6999) as well as any firm with a financial business segment. I also require that the sum of segment sales be within 1% of firm sales and the sum of segment assets be within 25% of firm assets. For those firms where segment assets do not sum up to firm assets, but do meet the 25% threshold, I either gross up or down the segment asset weights to account for the discrepancy wherever asset weights are necessary.

Given the wide range of firm size, any criteria for determining whether a firm is small is somewhat arbitrary. I choose to classify a firm as small in a manner similar to the cutoffs set in B&O95. I classify all firms with net sales less than or equal to $20 million in 1986 dollars (the first year of the B&O95 sample) as small. To help restrict the analysis to economically relevant firms and to avoid valuation multiples with components close to zero (the original size restriction reasoning in B&O95), I require that both firm sales and assets exceed $1 million in 1986 dollars. By comparison, the smallest firm listed in the 1986 S&P Composite had total assets of $1.24 million and net sales of $0.63 million.

The resultant sample consists of 11,140 multi-segment firm-year observations from 1978-1997. This consists of 9,778 large multi-segment firm-years and 1,362 small multi-segment firm-years. I also create a comparable small single-segment sample to use as a benchmark for the small multi-segment firms. This sample is comprised of 21,186 small single-segment firm-year observations. I list the sample counts by year in Table 2. The small multi-segment sample is evenly distributed across each year at around seventy firms per year and averages 13% of the entire multi-segment sample.

[Insert Table 2]

Geographic Segments and Customer Data

Under FASB rule SFAS 14, a firm must disclose any foreign operations if they represent more than 10% of consolidated revenues or if more than 10% of consolidated assets reside in foreign operations. The company must report each significant (meeting the 10% rule) geographic region individually as well as a catch-all segment that aggregates the remaining regions not considered significant. Geographic regions can be individual countries or groups of countries and this is left to the reasonable discretion of the reporting firm. Geographic segments are identified in the Compustat industry segment files in a similar format to the business segment files. Reporting geographic segments and business segments is not mutually exclusive and is typically overlapping. For more on geographic segment disclosures, see Herrmann and Thomas (2000).

According to FASB rule SFAS 14, a firm must also report the identity of any single customer that comprises at least 10% of total sales as well as the business segment that is the primary vendor to that customer. These customers are identified in the Compustat industry segment files and are classified by Company, Geographic Region, Market, State Government, Local Government, Domestic Government, or Foreign Government. Since my analysis utilizing customer data is concerned with the bargaining power of a single entity or a few entities, I ignore any sales generated from customers labeled as a Market or Geographic Region and consider these sales atomistic. Further, since customers are only reported if the breach the 10% threshold, a sample requiring an observation in the customer segment files will likely be biased towards smaller firms. I assume that, if a firm reports data in the business segment file, but not in the customer segment file, they do not possess any major customers and that all of their sales are to atomistic companies. For an expanded discussion of the customer segment files, see Fee and Thomas (2004).

IV. Methodology

Tobin's q and Imputed Tobin's q

Tobin (1969) defines q as the market value of assets divided by the replacement value of assets and argues that it captures all relevant information about the value of a firm's growth opportunities. As a proxy for Tobin's q, I calculate the market value of equity plus the book value of assets less the book value of equity and deferred taxes divided by the book value of assets.

$$\text{Tobin's q} = \frac{\text{MVE} + \text{BVA} - \text{BVE} - \text{Tax}}{\text{BVA}}$$

It is not possible to directly observe the Tobin's q of individual business segments in multi-segment firms. Consequently, these ratios must be imputed to analyze the valuation of multi-segment firms and the efficiency of their inter-segment resource allocations. The previous literature on diversified firms has typically imputed the Tobin's q of individual business segments by using the median or the asset-weighted average of the Tobin's q ratios for a sample of single-segment or "pure-play" firms in the same 4-digit, 3-digit, or 2-digit SIC code as the business segment in the diversified firm. This methodology is based on the work of Wernerfelt and Montgomery (1988) who demonstrate that industry effects are the largest identifiable driver in the variation of Tobin's q. However, they show that industry effects explain, at best, only 20% of this variation. This implies that the process of using median industry q is inherently noisy. The induced measurement error presents several problems for inferences about the value of multidivisional firms and their resource allocations. Whited (2001) argues that the measurement error associated with using median Tobin's q can account for the cross-subsidization results found in the literature while Campa and Kedia (2002) argue that multidivisional firms are inherently different than the median single-segment firm. By holding multi-segment firms to a benchmark generated by single-segment firms may, again, lead to incorrect inferences about the value impacts of diversification.

To address the issue of measurement error associated with imputing Tobin's q using industry medians, I follow the fitted q methodology advanced by Billett and Mauer (2003). I impute beginning-of-period and end-of-period Tobin's q by fitting it using a sample of single-segment firms meeting the B&O95 criteria (sales > $20 MM, sum of sales within 1% of firm sales, sum of assets within 25% of firm assets, and has total capital) parsed by 2-digit SIC code. I fit the imputed qs by running OLS regressions for each 2-digit industry and year specified as

$$\text{Imputed Tobin's q}_{it} = \hat{\beta}_0 + \hat{\beta}_1 SIZE_{it} + \hat{\beta}_2 CFA_{it} + \hat{\beta}_3 TO_{it}$$

where $SIZE_{it}$ is defined as the log of deflated segment assets, CFA_{it} is defined as the ratio of segment EBIT to assets, and TO_{it} is the ratio of segment sales to assets. To avoid unreasonable computed values, I bound the imputed Tobin's q between the minimum and maximum Tobin's q within each industry and year. In unreported tests, I find that the resultant imputed beginning-of-period Tobin's q is, on average, 0.35 higher than the imputed q using industry medians and they are significantly correlated. The main results are qualitatively similar when I use industry medians to impute Tobin's q instead of OLS regressions.

Excess Value

To measure the value of the diversified firm, I take the "chop-shop" approach advocated in Lang and Stulz (1994). They argue that the value of the diversified firm should be the sum of the imputed values of the individual business segments. Consequently, if a multi-segment firm's Tobin's q is less (greater) than the weighted sum of the imputed Tobin's q of the individual business segments, then there is evidence of value loss (gain) from diversification. I compute Lang and Stulz Excess Value as

$$\text{Lang and Stulz Excess Value} = \log q - \log \sum_{i=1}^{n} w_i q_i$$

where q is the Tobin's q of the firm, w_i is the sales weight of the ith business segment, and q_i is the imputed Tobin's q of the ith business segment.

Measures of Firm and Segment Profitability

I use the firm's return on assets (ROA) to proxy for firm profitability. I define ROA as

$$\text{ROA} = \frac{\text{EBITDA - Dep - Amort}}{\text{Net PPE} + \text{CA}}$$

where *EBITDA* is operating income before depreciation and amortization, *Dep* is depreciation expense, *Amort* is amortization expense, *Net PPE* is net property, plant and equipment, and *CA* is current assets. I use the amount a cash flow that a business segment produces as a proxy for segment profitability. I define segment cash flow as operating profit plus depreciation. I assign a segment a dummy variable equal to one if it has negative cash flow and aggregate this variable at the firm-level to determine the percentage of segments with negative cash flow (% Neg CF Segs).

Measure of Information Asymmetry

In an efficient market, the firm's stock price should fully incorporate all available information about the firm. In this environment, all stock price movements represent the release of previously undiscovered information to the market. Everything else being equal, larger stock price shocks imply greater levels of previously unrevealed information. Similar to Peyer (2002), I use the variance of the net-of-market (defined as the CRSP Value Weight index including distributions) daily stock returns in a given year as a proxy for the degree of information asymmetry within the diversified firm.

Measures of Internal Capital Market Efficiency

I first measure the efficiency of a corporation's internal capital market using the efficiency proxy presented in Rajan, Servaes, and Zingales (2000). Relative Value by Allocation (RVA) measure the extent at which the segments with the best growth prospects receive the abnormally high or above firm average levels of investment. If a corporation transfers resources from low

value divisions to high value divisions, one could argue that they are re-allocating capital efficiently. To estimate the efficiency of this resource transfer, I first impute the investment ratio (capital expenditures as a percentage of segment assets or sales) that each segment would have if it were a stand-alone entity. I define the imputed investment ratio as the median investment ratio of the single-segment firms residing in the narrowest 4-digit, 3-digit, or 2-digit SIC code grouping that yields at least 5 firms. If a segment is receiving investment resources in excess of what it should as a stand-alone entity, then it is effectively receiving a transfer of resources from other divisions.

It is possible that diversified firms might simply have greater access to investment resources to spend on each segment than pure-play firms. If this is the case, an observed higher than industry average investment ratio could then erroneously be interpreted as a transfer to that segment. Relative Value by Allocation (RVA) corrects for this by first adjusting for the level of resources that a diversified firm enjoys in excess of its single-segment peers. The excess level of resources is defined by the sales-weighted sum of the excess investment ratios of each division within the firm, or

$$\text{Weighted Excess Investment Ratio} = \sum_{j=1}^{n} w_j \left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}} \right)$$

where w_j is segment j's sales weight and where $CAPEX_j / SALE_j$ and $CAPEX_j^{SS} / SALE_j^{SS}$ are the investment ratios for segment j and segment j's industry, respectively. RVA then examines whether the highest growth segments, relative to the opportunities of the other segments throughout the firm, enjoy the highest industry-adjusted investment rates after correcting for the potential excess resources of the diversified firm. I calculate RVA as:

$$\text{RVA} = \sum_{j=1}^{n} \frac{SALE_j}{SALE} (q_j - \bar{q}) \left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}} - \sum_{j=1}^{n} w_j \left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}} \right) \right)$$

where *SALE* represents the firm's net sales, $SALE_j$ is segment j's net sales, q_j is the imputed Tobin's Q of segment j, and $\overline{q}$ is the sales-weighted average Tobin's Q of the firm. $CAPEX_j$ / $SALE_j$ is the investment ratio for segment j while $CAPEX_j^{SS}$ / $SALE_j^{SS}$ is the median investment ratio for the pure-play firms that reside in segment j's industry. For single-segment firms, RVA is zero. Positive (negative) values of RVA indicate efficient (inefficient) resource allocations.

Peyer and Shivdasani (2001) define Cash Flow Sensitivity (CF Sensitivity) as an alternative measure of internal capital market efficiency. Their measure tracks the sensitivity of segment investment, relative to the firm's investment, to higher-than-firm-average segment cash flows. The presumption is that greater investment in high cash flow segments is an efficient allocation of resources. The advantage of CF Sensitivity is that it does not rely on imputed values in its calculation. I specify CF Sensitivity as:

$$\text{CF Sensitivity} = \sum_{j=1}^{n} \frac{SALE_j}{SALE}\left(cf_j - \overline{cf}\right)\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX}{SALE}\right)$$

where cf_j is the cash flow of segment j, $\overline{cf}$ is the sales-weighted average cash flow of the firm, $CAPEX_j$ / $SALE_j$ is the investment ratio for segment j, and *CAPEX* / *SALE* is the overall investment ratio of the firm. The cash flow sensitivity is zero-valued for single segment firms while positive (negative) values represent efficient (inefficient) resource allocations.

CF Sensitivity has a decidedly different context than RVA since higher current cash flows do not always translate into superior growth opportunities. Although Poterba (1988) argues that cash flow may have incremental information over q in defining future growth opportunities, current cash flow might have an alternative interpretation. In smaller financially constrained firms, excess investment into the highest cash flow producing segments might instead indicate management's focus on the firm survival and current liquidity. Consequently, the interplay between the results using CF Sensitivity and RVA will be indicative of management's priorities in regards to current liquidity and future growth.

Measures of Internal Capital Market Size and Diversification

The simplest measures of diversification and firm complexity are the number of business and geographic segments. In addition to these proxies, I construct two revenue-based Herfindahl indices to account for the size and complexity of a firm's internal capital market as well as the degree of line-of-business and geographic diversification. The Herfindahl index represents the degree of concentration of a firm's resources across its divisions. The greater the focus of a firm towards any one segment among its divisions, the higher the value the index takes. Since the business segment data is organized across industry lines, this measure also gives an indication of the degree of diversification within the firm. Taking the inverse of this index gives a proxy for internal capital market size that behaves comparably with the number of business segments in that it is increasing monotonically with the number of segments. I construct the Inverse Herfindahl index as:

$$\text{Inverse Herfindahl} = \left[\sum_{j=1}^{n} \left(\frac{SALE_j}{\sum_{j=1}^{n} SALE_j} \right)^2 \right]^{-1}$$

where $SALE_j$ represents segment j's net sales. I construct this measure using a firm's business segments as a proxy for the size of the corporate internal capital market and the diversity of the firm across business units. I also construct this measure using a firm's geographic segments as a proxy for geographic diversification and organizational complexity.

Measures of Customer Bargaining Power

I proxy for the bargaining power of customers over their suppliers by the fraction of their vendor's sales. Using the customer segment data, I identify the percentage of a firm's sales that are

derived by the single largest customer (% Largest Cust). I presume that all sales to customers not listed in the segment files are to atomistic customers for purposes of constructing this measure.

Measures of Leverage, Use of External Capital, and Financial Constraint

I measure the amount of firm leverage as the total debt to asset ratio (Debt to Assets). Lewellen (1971) argues that diversified firms, by nature of having imperfectly correlated cash flows, enjoy a coinsurance effect that permits them enhanced borrowing capacity. To measure the degree of excess leverage taken on by multi-segment firms, I construct the Excess Leverage measure developed in B&O95 as:

$$\text{Excess Leverage} = \frac{DEBT}{ASSETS} - \sum_{j=1}^{n} \frac{ASSETS_j}{ASSETS} \times \frac{DEBT_j^{SS}}{ASSETS_j^{SS}}$$

where *ASSETS* are firm assets, $ASSETS_j$ are segment assets, *DEBT* is total firm debt, and $DEBT_j^{SS}/ASSETS_j^{SS}$ is the median debt-to-asset ratio of the single-segment firms in segment j's industry.

I use the proxy Excess Net External Capital, developed in Peyer (2002), to measure the degree to which a multi-segment firm accesses all external capital markets. Peyer (2002) defines Excess Net External Capital including Dividends and Interest as:

$$\text{Excess Net External Capital} = \frac{Net\ External\ Capital_t - \sum_{j=1}^{n} SALE_{j,t} \times \left(\frac{Net\ External\ Capital_{j,t}^{SS}}{SALE_{j,t}^{SS}} \right)}{ASSETS_{t-1}}$$

where $Net\ External\ Capital_t$ is defined as net stock issued plus net long-term debt issued plus the change in short-term debt less cash dividends and interest, $SALE_{j,t}$ is segment j's net sales, $ASSETS_{t-1}$ is beginning-of-period firm assets, and $Net\ External\ Capital_{j,t}^{SS} / SALE_{j,t}^{SS}$ is the median net external capital to sales ratio for the single-segment firms in segment j's industry.

To measure the degree of financial constraint, I use the proxy developed in Peyer (2002), Excess Internal Cash Flow including Dividends and Interests. I also use the Kaplan-Zingales index

developed in Kaplan and Zingales (1997). I use the estimation specification detailed in Lamont, Polk, and Saa-Requejo (2001) when computing the K-Z Index. Excess Internal Cash Flow indicates abnormally high levels of industry-adjusted cash flow and is computed as:

$$\text{Excess Internal Cash Flow} = \frac{\textit{Internal Cash Flow}_t - \sum_{j=1}^{n} SALE_{j,t} \times \left(\frac{\textit{Internal Cash Flow}_{j,t}^{SS}}{SALE_{j,t}^{SS}} \right)}{ASSETS_{t-1}}$$

where $\textit{Internal Cash Flow}_t$ is net cash flow from operations less changes in working capital plus interest, $SALE_{j,t}$ is segment j's net sales, $ASSETS_{t-1}$ is beginning-of-period firm assets, and $\textit{Internal Cash Flow}_{j,t}^{SS} / SALE_{j,t}^{SS}$ is the median internal cash flow to sales ratio for the single-segment firms in segment j's industry. I compute the Kaplan-Zingales index as:

$$\text{KZ Index} = -1.001909 \times \frac{\textit{Cash Flow}}{\textit{Capital}} + 0.2826389 \times Q + 3.139193 \times \frac{\textit{Debt}}{\textit{Capital}} - 39.3678 \times \frac{\textit{Dividends}}{\textit{Capital}} - 1.314759 \times \frac{\textit{Cash}}{\textit{Capital}}$$

where *Capital* is net PP&E, *Cash Flow* is income before extraordinary items and depreciation, *Q* is Tobin's q, *Debt* is total debt, *Dividends* is cash dividends, and *Cash* is cash and marketable securities. The K-Z index is increasing in the degree of financial constraint.

V. Results

Summary Statistics

In Table 3, I present simple summary statistics for the entire diversified firm sample. To dampen the effects of outliers, I have winsorized all calculated variables at the 1% and 99% levels. There still is substantial skewness in the data and therefore I emphasize median values instead of means when possible.

I am able to uncover several empirical regularities documented in the existing literature. Consistent with Lang and Stulz (1994) and B&O95, the diversified firms in my sample exhibit a significant median diversification discount of 21%. This is similar to the discount identified in earlier work. B&O95 find an average discount of 13-15% and Lang and Stulz (1994) find an average q discount of 0.35-0.49 (this implies a 33-56% discount at sample means). I find that RVA

is significantly negative mean (median) value of -0.0010 (-0.0001) indicating cross-subsidization in the unconditional sample. In contrast, I find that CF Sensitivity is significantly positive means and medians of 0.0014 and 0.0001. This implies that managers prefer to allocate resource towards the business units with the highest current profitability, rather than to those units with the best opportunities. Ahn, Denis, and Denis (2006) find that the cross-subsidization result is not uniform over different subperiods and is significantly less negative in the 1990s. In unreported tests, I restrict my sample to the 1980-1993 subperiod investigated by Rajan, Servaes, and Zingales (2000). I find a significantly negative mean RVA of -0.00093 and significantly negative median RVA of -0.00005. CF Sensitivity remains significantly positive over this interval. Thus, I document evidence of inefficient resource allocation within corporate internal capital markets and a managerial preference for investment in high cash flow divisions for my unconditional diversified firm sample.

The typical sample firm is diversified into multiple lines of business, but is geographically concentrated. Diversified firms in my sample have a mean (median) inverse Herfindahl index of 1.93 (1.81) and 1.24 (1.00) for their business and geographic segments, respectively. On average, they operate 2.7 business segments and operate in 2.2 geographic regions (the second geographic segment typically has miniscule sales). Consistent with B&O95, diversified firms utilize their excess debt capacity and are more highly levered than their single-segment counterparts. I find that the median multi-segment firm takes on 4% more of their assets in debt than a similar asset-weighted portfolio of single-segment firms. Large customers have little influence over most of the diversified firms in my sample. The median diversified firm does not have a large customer and the mean firm has only 1.6% of its sales coming from its single largest customer.

[Insert Table 3]

Small Focused Firms v. Small Diversified Firms

Before I explore the value of diversification in small and large multi-segment firms, it is informative to compare the characteristics of small diversified firms to a sample of small focused firms. As displayed in Table 4, the mean and median small diversified firm trades at a significant discount to its single-segment peers. This is the first documented evidence that the diversification discount exists for smaller multi-segment firms. In addition to higher relative valuations, smaller focused firms also have higher absolute valuations as well. The median single-segment firm has a Tobin's q of 1.74 while the median multi-segment firm has a Tobin's q of 1.35. Alternatively, this implies that small focused firms are concentrated in high-growth industries.

These firms are fairly comparable in terms of size. The median single-segment firm has $7.48 million in assets and $6.36 in sales while the median multi-segment firm has assets of $7.94 million and significantly larger sales of $10.02 million. Both single- and multi-segment firms are largely restricted to domestic operations. Single-segment firms operate, on average, in 1.98 geographic regions while multi-segment firms operate in an average of 1.96 geographic regions. Both types of firms are heavily concentrated in their domestic segments with mean (median) inverse Herfindahl indices of 1.05 (1.00) and 1.06 (1.00) for single- and multi-segment firms, respectively. Small multi-segment firms have a greater concentration of their sales in large customers. The mean single-segment firm has 1.6% of its sales with large customers while the mean multi-segment firm has almost double that number. Not surprisingly, the single-segment firms are significantly younger. The median single-segment firm is 6.00 years-old while the median multi-segment firm is 9.00 years-old.

[Insert Table 4]

Large Diversified Firms v. Small Diversified Firms

Although small diversified firms should trade at a discount like their larger counterparts, there is little to glean from the extant literature as to whether they should suffer the same magnitude of a discount. In Table 4, I compare the characteristics of large and small diversified firms. Although small diversified firms are subjected to the diversification discount, they trade at a premium to large diversified firms. The median small diversified firm is valued 4.4% higher than the median large diversified firm. This effect is robust to using the traditional industry median q approach when constructing excess value (significant difference of 3.1%). The disparity is even more salient when I look at sample means. The mean small diversified firm is valued 14.7% higher than the mean large diversified firm. Stowe and Xing (2006) show that the diversification discount is not due to differences in growth opportunities, so it is unlikely that this valuation difference is due solely to the finding that smaller diversified firms have higher Tobin's q values than larger diversified firms.

[Insert Table 5]

It is possible that smaller diversified firms trade at a different diversification discount due than larger diversified firms due to differences in resource allocations. Although the small multi-segment firms have higher valuations, there is some evidence that small diversified firms actually allocate resources more inefficiently than in large diversified firms. Small diversified firms have significantly lower mean values of RVA (large: -0.0009 v. small: -0.0015) and significantly lower mean and median values of CF Sensitivity (large: 0.0016 and 0.0001 v. small: -0.0003 and -0.0001). The median results for RVA insignificantly different from one another at conventional levels.

To determine whether small firms have malfunctioning internal capital markets (as documented in Table 5), after controlling other firm characteristics, I conduct a multiple regression analysis and report the results in Table 6 Model 1. I estimate an OLS regression of the form:

$$\text{Efficiency Measure} = \beta_0 + \beta_1 Small + \beta_2 Characteristics + \varepsilon$$

where Efficiency Measure represents either RVA or CF Sensitivity, *Small* is an indicator variable that equals one if a firm's sales are less than $20 million in 1986 dollars, and *Characteristics* is a vector of firm characteristics. When I control for moderating factors, the efficiency of small diversified firms' internal capital market is not significantly than that observed in large diversified firms (in subsequent tests, the small dummy is often significantly positive). Consequently, there is little evidence that small diversified firms allocate capital any worse than in larger diversified firms.

[Insert Table 6]

In Table 7, I examine if the small firm premium persists in a multiple regression setting. I estimate OLS regressions of the form:

$$\text{Excess Value} = \beta_0 + \beta_1 Small + \beta_2 Characteristics + \varepsilon$$

where Excess Value is Lang & Stulz's (1994) excess value, *Small* is an indicator variable that equals one if a firm's sales are less than $20 million in 1986 dollars, and *Characteristics* is a vector of firm characteristics. After controlling for several typical covariates, I find that small diversified firms trade at a statistically and economically significant 14.6% premium to large diversified firms. This small firm premium is persistent through all of the tests conducted in this analysis and ranges from 10.8% to an astounding 22.8%.

I also demonstrate results previously identified in the literature. Diversification itself, as proxied by the number of business segments, reduces firm value (Lang and Stulz, 1994). The coefficient on the number of business segments is significantly negative. I also show that efficient allocation of resources in a firm's internal capital market adds value (Rajan *et al*., 2000). The coefficient on RVA is significantly positive and improvements in a firm's resource allocation process have a substantial impact on a diversified firm's excess value. The diversified firm

experiences an increase its market capitalization by 81 b.p. for a one standard deviation increase in its resource allocation.

[Insert Table 7]

Agency Conflicts, Managerial Discretion, External Capital, and Outside Monitoring Pressures

If small diversified firms use proportionally more external capital than larger diversified firms, H1 predicts that outside monitoring pressures will limit the agency problems associated with managerial discretion, increase firm value, and, if upper management can exert sufficient pressure upon division managers, improve resource allocation within the firm. By nature of being more constrained, smaller diversified firms likely access the capital markets more frequently to remain as a going concern. I use Excess Segment Leverage as defined in Berger and Ofek (1995) and Excess Net External Capital as defined in Peyer (2002) to proxy for the use of external capital. The available evidence in Table 5 is indicative that small diversified firms access the capital markets more frequently. Smaller diversified firms have significantly higher mean excess segment leverage (large: 0.06 v. small: 0.09) and significantly higher mean and median excess net external capital (large: -0.01 and -0.04 v. small: 0.13 and 0.00).

It appears that frequent trips to the capital markets have a beneficial impact on the inner workings of corporate internal capital markets in small firms. I show in Table 6 models two and three that, for small firms, both proxies of the use of external capital lead to significant improvements in the efficiency of resource allocations. The interaction of the small dummy with both Excess Segment Leverage and with Excess Net External Capital is significantly positive. It also appears that increased monitoring by outside investors can mitigate the agency problems associated with managerial discretion. In Table 7, models two and three, I find a positive and significant relation between both proxies of usage of external capital and excess value for small firms. The interaction term of small and Excess Segment Leverage is positive and significant at the

1% level. For a reduced sample, I find the same effect using Excess Net External Capital, which measures the use of both debt and equity instruments. The regression models using this proxy have the most explanatory power for Excess Value of those used throughout the paper. These results imply that the small firm premium for diversified firms is due, in part, to the increased use of external capital and the heightened monitoring or disciplinary effects associated with repeated appeals to outside investors for additional capital.

Agency Conflicts Associated with Divisional Rent-Seeking Behavior and Firm Complexity

The more complex the organization, the more likely that division managers will have the opportunity to engage in unobservable or non-contractible rent-seeking behavior. H2 predicts that the efficiency of resource allocations will decrease the more complex and geographically diverse the organization is. I use the Number of Geographic Segments to proxy for the complexity and geographic dispersion of the firm's internal capital market. I show in Table 5 that small diversified firms are largely domestic operations. They have less geographic segments than large diversified firms (large: 2.72 v. small: 2.27) and are significantly more concentrated in their home segment (Geo Herf: 1.27 v. 1.06).

I test the predictions of H2 in model four in both Tables 6 and 7. Consistent with the predictions in H2, for small firms, geographic dispersion reduces the efficiency of resource allocations. The coefficient on the interaction term between the small dummy and the Number of Geographic Segments is negative, but it is not significant at conventional levels. None-the-less, this effect does filter through to the Excess Value regressions in Table 7. The coefficient on the interaction term is negative and significant, but only at the 8% level.

The Small Firm Affect and Risks Associated with Asymmetric Information

The "small firm effect" described in H3 predicts that small diversified firms should trade at a greater discount, given that valuations and expected returns are inversely related. If profitability

and financial leverage are moderating factors, H3 predicts that leverage (Debt to Assets) should be inversely related to excess value for small firms and that ROA be directly related to excess value for small firms. I present conflicting evidence regarding the "small firm effect" in Table 8, model one. I document that the "small firm effect" of Banz (1981) and Reinganum (1981) does play a role in the diversified firm sample. The coefficient on the log of firm sales is positive and significant at the 1% level. This indicates that larger firms experience higher excess valuations, which is consistent with the results reported by Errunza and Senbet (1984). In spite of this effect, the small dummy remains a significantly positive 13%, which implies that there are substantial non-linearities in the size-excess value relation. I find little evidence that financial leverage or profitability plays a role, since the coefficients on the interactions between the small dummy, Debt to Assets, and ROA have significant coefficients in the opposite direction. The Debt to Asset result is, instead, more consistent with H1 which predicts that the increased use of external capital limits managerial agency issues.

H4 predicts that greater information asymmetries should be priced and that these should result in lower excess values. In Table 5, I report that small diversified firms have greater mean and median levels of information asymmetry, as proxied by Residual Variance, than those in larger diversified firms (large: 0.0010 and 0.0005 v. small: 0.0036 and 0.0021). I test whether this difference has a moderating effect on Excess Value in Table 8, model 2. Consistent with H4, higher levels of information asymmetry result in lower valuations. The coefficient on Residual Variance is negative and significant at the 1% level. However, the coefficient on the interaction between the small dummy and Residual Variance is strongly positive and significant. This result is difficult to rationalize unless one takes an option pricing approach to valuing smaller diversified firms.

[Insert Table 8]

Resource Allocation, Financial Constraints, and Customer Power

H5a and H5b have competing predictions about the impact of financing constraints on the efficacy of internal resource allocations. The constrained firm might choose to allocate resources to the divisions that ensure its survival. As suggested in H5a, the more constrained that the firm is, the more likely that management will give preference to cash-rich divisions when doling out resource endowments. Alternatively, H5b suggests that an internal capital market only adds value in the presence of financing constraints and that resource allocation will improve the more constrained a firm is. There is evidence in Table 5 that small diversified firms are more constrained than large diversified firms. They produce significantly less Excess Internal Cash Flow (large: 0.07 and 0.07 v. small: -0.06 and 0.01) and have significantly higher median values of the Kaplan-Zingales index (large: -0.24 v. small: 0.96). I show the effects of financial constraints on the resource allocation process in Table 9, models one and two. The coefficient on the interaction term between the small dummy and Excess ICF is negative and significant impact on RVA in model indicating that constraints improve the allocation of resources. In model two, the interaction between the small dummy and Excess ICF has an insignificant impact on CF Sensitivity. This suggests that as the small firm's investment choices, when constrained, are governed by growth opportunities and not liquidity.

[Insert Table 9]

It appears that excess free cash flow is also detrimental to firm value. In the Excess Value Regressions in Table 10, models one and two, both measures of financial constraint have a negative effect on firm value. The less constrained the firm is and the more free cash flow it has at its disposal, the lower its valuation. The coefficient on Excess ICF is negative and significant. Excess ICF is even more corrosive for the small firm, as evidenced by the much larger coefficient in the interaction term and its heightened significance. A similar result holds for the K-Z Index.

These results are most consistent with H5b as well as the external monitoring hypotheses (H1) and Jensen's (1986) free cash flow hypothesis.

In model three of both Tables 9 and 10, I present the evidence on customer bargaining power over the workings of corporate internal capital markets and firm excess value. H6 predicts that large customers will demand preferential treatment which may require specific investments that may, or may not, be value creating. There is some evidence that small diversified firms are more at the mercy of large customers. Smaller firms have significantly greater large customer concentrations than their larger counter parts as measured by the average percentage of sales to their largest customer (1.56% v. 2.79%). There is little evidence, however, that this has any effect on resource allocation. In Table 9, the Percentage of Large Customer Sales variable has an insignificant impact on RVA. In spite of this, having a large customer does have a significant effect on firm value. Small diversified firms actually see *increased* valuations for having a large customer. This is likely due to the fact that nearly all of the customers in the pre-1998 customer dataset are government organizations that might be interested in subsidizing smaller businesses for social purposes.

[Insert Table 10]

VI. Conclusions

The existing work on corporate conglomerates has almost completely excluded small firms. This is due largely to the success of the Berger and Ofek (1995) sample selection methodology. This sampling methodology specifically excludes small firms with sales under $20 M. Consequently, we know almost nothing about how smaller diversified firms allocate capital internally or whether they are also subject to the diversification discount. Using a sample of 11,140 multi-segment firm-year observations from 1978-1997, I provide the first evidence on the value impact of diversification in small diversified firms.

I find that smaller diversified firms (defined as less than or equal to $20 million in sales in 1986 dollars) trade at a discount to a size- and performance-matched portfolio of single-segment firms in the same industry. Small diversified firms experience a diversification discount relative to their single-segment peers of 3.2% - 17.3%. When I compare these small diversified firms to their larger diversified counterparts, they actually trade at a 3.1% - 14.7% premium. This result remains after controlling for industry and other firm characteristics in a multiple regression setting. Thus, I find that diversification is associated with lower firm value, but smaller firms are not as negatively affected by the diversification discount as are larger firms.

I hypothesize that the small firm diversification premium can partially be explained by the influence of outside monitoring by the external capital markets which limits the agency problems associated with managerial discretion over free cash flow and rent-seeking behavior on the part of division managers. I have also found evidence of the "small firm effect" documented by Banz (1981) and Reinganum (1981) as well as the impacts of asymmetric information, financial constraints, and large customers on firm value. However, even after identifying these moderating effects, a positive and significant small firm premium exists relative to larger diversified firms. The origin of this remaining premium is unknown at this point, and future research should further explain the cause of the small firm premium.

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TABLE 1
Large Sample Studies of Diversification and Internal Capital Markets

Study	Data	Size Requirement	Result
Lang and Stulz (1994)	1978-1990 Compustat universe	Assets > $100 M	Negative relation between EV and diversification
Berger and Ofek (1995)	1986-1991 Compustat universe	Sales > $20 M	Negative relation between EV and diversification caused by overinvestment and cross-subsidization
Comment and Jarrell (1995)	1978-1989 NYSE and ASE firms	None	Positive relation between EV and focusing
Berger and Ofek (1996)	1984 & 1987 Compustat universe	Sales > $20 M	Firms with lower EV are more likely to be acquired
Shin and Stulz (1998)	1980-1992 Compustat universe	None; Large firm sample: Sales > $1 B (1977 $s)	Segment investment is dependent on other segment CF
Rajan, Servaes, and Zingales (2000)	1980-1993 Compustat universe	Sales > $20 M	Negative relation between ICM efficiency and diversification which leads to lower EV
Lamont and Polk (2001)	1979-1997 Compustat universe	Sales > $20 M	EV and E[r] are inversely related; Variation in EV due to future CFs
Campa and Kedia (2002)	1978-1996 Compustat universe	Sales > $20 M	Diversification is endogenously chosen
Denis, Denis, and Yost (2002)	1984-1997 US Compustat firms	Sales > $20 M	Negative relation between EV and geographic diversification
Graham, Lemmon, and Wolf (2002)	1980-1995 SDC M&A database	Sales > $20 M	Reductions in acquirer EV post-merger are due to acquisition of low EV targets
Lamont and Polk (2002)	1979-1997 Compustat universe	Sales > $20 M	Exogenous diversity shocks reduce EV
Maksimovic and Phillips (2002)	1975-1992 LRD US manufacturing firms	Firm Shipments > $1 M	Conglomerate discount is consistent with profit maximization
Mansi and Reeb (2002)	1988-1999 Disclosure Worldscope firms	Sales > $50 M	Diversification causes a wealth transfer from equity to debt
Peyer (2002)	1980-1998 Compustat universe	Sales > $10 M (1990 $s)	Efficient ICMs use more external capital and have higher EV
Schoar (2002)	1977-1995 LRD firms	None	Conglomerates are more productive than stand-alone firms, but suffer productivity losses upon diversificiation
Billett and Mauer (2003)	1990-1998 Compustat universe	Sales > $20 M	Financing constraints drive the ICM efficiency - EV relation
Bans and Monahan (2004)	1980-1996 AIMR rankings	Sales > $20 M	Positive association between voluntary disclosure and EV
Chevalier (2004)	1980-1995 CRSP M&A database	None	Cross-subsidization patterns appear in merging pairs pre-merger
Villalonga (2004)	1989-1996 BITS US establishments	None	Diversification discount an artifact of segment data
Ahn, Denis, and Denis (2006)	1979-1997 Compustat universe	Sales > $20 M	Diversified firms shift debt burden to high q segments

TABLE 2
Number of Sample Firms by Year

Number of sample multi-segment firm-year observations (excluding financials) from 1978-1997. Large firms are defined as those with net sales greater than $20 MM (1986 dollars) and small firms are defined as those with net sales less than or equal to $20 MM (1986 dollars).

Year	All Diversified Firms	Large Diversified Firms	Small Diversified Firms	Small Focused Firms
1978	228	214	14	202
1979	286	264	22	316
1980	344	313	31	429
1981	413	370	43	717
1982	398	341	57	805
1983	419	354	65	957
1984	794	693	101	1,005
1985	744	656	88	1,047
1986	647	566	81	1,192
1987	625	538	87	1,242
1988	644	561	83	1,198
1989	632	548	84	1,139
1990	618	549	69	1,150
1991	609	537	72	1,167
1992	596	518	78	1,200
1993	592	517	75	1,240
1994	651	579	72	1,266
1995	669	579	90	1,480
1996	652	570	82	1,729
1997	579	511	68	1,705
Total	**11,140**	**9,778**	**1,362**	**21,186**

TABLE 3
Summary Statistics

Univariate statistics for 11,140 diversified firms from 1978-1997. *Excess value* is defined by Lang and Stulz (1994) as

$$\text{Excess Value} = \log q - \log \sum_{i=1}^{n} w_i q_i$$

where the imputed q is either fitted using OLS regressions or using the median of the narrowest 4-digit, 3-digit, or 2-digit industry that yields five firms. *RVA* and *CF Sensitivity* are defined by Rajan, Servaes, and Zingales (2000) and Peyer and Shivdasani (2001) as

$$\text{RVA} = \sum_{j=1}^{n} \frac{SALE_j}{SALE}(q_j - \bar{q})\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}} - \sum_{j=1}^{n} w_j\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}}\right)\right) \quad \text{CF Sensitivity} = \sum_{j=1}^{n} \frac{SALE_j}{SALE}(cf_j - \overline{cf})\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX}{SALE}\right)$$

Small firms are defined as those with sales of less than or equal to $20 M in sales (1986 dollars). *CAPX to Sales* is firm capital expenditures divided by firm sales. *# Bus Segments* is the number of business segments listed in Compustat. *Bus Inverse Herf* is the inverse of a revenue-based Herfindahl index on the firm's business segments. *# Geo Segments* is the number of geographic segments listed in Compustat. *Geo Inverse Herf* is the inverse of a revenue-based Herfindahl index on the firm's geographic segments. *% Largest Cust* is the percentage of firm sales comprised by the single largest customer. *Assets* is firm assets and *Sales* is firm sales. *Tobin's q* is defined the market value of equity plus the book value of assets less the book value of equity and deferred taxes divided by the book value of equity. *ROA* is EBITDA less Dep & Amort divided by Net PPE and Current Assets. *% Neg CF Segs* is the percentage of business segments with negative operating profit before depreciation. *Debt to Assets* is total debt to assets. *ln(Firm Age)* is the natural log of firm age, which is defined as the earliest firm observation available in either Compustat or CRSP. *Excess Seg Lev* is the amount of leverage taken on by the multi-segment firm in excess of single-segment firms in the same industry. The measure is defined in Berger and Ofek (1995) as

$$\text{Excess Leverage} = \frac{DEBT}{ASSETS} - \sum_{j=1}^{n} \frac{ASSETS_j}{ASSETS} \times \frac{DEBT_j^{SS}}{ASSETS_j^{SS}}$$

Excess ICF is excess internal cash flow and *Excess NEC* is excess net external capital. Both measures are defined in Peyer (2002) as

$$\text{Excess Net External Capital} = \frac{Net\ External\ Capital_t - \sum_{j=1}^{n} SALE_{j,t} \times \left(\frac{Net\ External\ Capital_{j,t}^{SS}}{SALE_{j,t}^{SS}}\right)}{ASSETS_{t-1}} \quad \text{Excess Internal Cash Flow} = \frac{Internal\ Cash\ Flow_t - \sum_{j=1}^{n} SALE_{j,t} \times \left(\frac{Internal\ Cash\ Flow_{j,t}^{SS}}{SALE_{j,t}^{SS}}\right)}{ASSETS_{t-1}}$$

KZIndex is the Kaplan-Zingales index defined in Lamont, Polk, and Saa-Requejo (2001). *Residual Variance* is the variance of net-of-market returns for a given year.

	All Diversified Firms					
Variable	**N**	**Mean**	**Median**	**Std Dev**	**Min**	**Max**
Excess Value (fitted q)	11,140	-0.19	-0.21	0.39	-1.23	2.16
Excess Value (median q)	11,140	-0.02	-0.06	0.36	-1.09	1.61
RVA	11,140	-0.0010	-0.0001	0.0102	-0.0480	0.0377
CF Sensitivity	11,140	0.0014	0.0001	0.0094	-0.0600	0.0711
CAPX to Sales	11,140	0.10	0.04	0.47	0.00	27.53
# of Bus Segments	11,140	2.66	2.00	0.93	2.00	10.00
Bus Inverse Herf	11,140	1.93	1.81	0.66	1.00	4.77
# of Geo Segments	11,140	2.23	2.00	0.63	1.00	4.00
Geo Inverse Herf	11,140	1.24	1.00	0.45	1.00	3.23
% Largest Cust	11,140	0.02	0.00	0.08	0.00	0.98
Assets	11,140	1329.68	170.25	3930.69	0.80	92159.26
Sales	11,140	1282.73	217.79	3707.88	0.12	102813.00
Tobin's Q	11,140	1.40	1.16	0.75	0.62	6.83
ROA	11,140	0.08	0.10	0.16	-4.23	0.76
% Neg CF Segs	11,140	0.12	0.00	0.23	0.00	1.00
ln(FirmAge)	11,140	2.85	3.04	0.84	0.69	4.29
K-Z Index	11,140	0.10	-0.12	138.40	-2539.10	13882.52
Excess ICF	11,140	0.05	0.07	0.17	-5.37	0.69
Debt to Assets	11,140	0.58	0.57	0.33	0.05	11.17
Excess Seg Lev	11,140	0.06	0.04	0.24	-0.61	4.15
Excess NEC	4,982	0.01	-0.04	0.30	-0.88	6.17
Residual Variance	10,658	0.0013	0.0005	0.0024	0.0001	0.0343

TABLE 4
Small Focused Firms v. Small Diversified Firms

Univariate statistics for 22,548 small focused and diversified firms from 1978-1997. *Excess value* is defined by Lang and Stulz (1994) as

$$\text{Excess Value} = \log q - \log \sum_{i=1}^{n} w_i q_i$$

where the imputed q is either fitted using OLS regressions or using the median of the narrowest 4-digit, 3-digit, or 2-digit industry that yields five firms. *RVA* and *CF Sensitivity* are defined by Rajan, Servaes, and Zingales (2000) and Peyer and Shivdasani (2001) as

$$\text{RVA} = \sum_{j=1}^{n} \frac{SALE_j}{SALE}(q_j - \bar{q})\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}} - \sum_{j=1}^{n} w_j\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}}\right)\right) \quad \text{CF Sensitivity} = \sum_{j=1}^{n} \frac{SALE_j}{SALE}\left(cf_j - \overline{cf}\right)\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX}{SALE}\right)$$

Small firms are defined as those with sales of less than or equal to $20 M in sales (1986 dollars). *CAPX to Sales* is firm capital expenditures divided by firm sales. *# Bus Segments* is the number of business segments listed in Compustat. *Bus Inverse Herf* is the inverse of a revenue-based Herfindahl index on the firm's business segments. *# Geo Segments* is the number of geographic segments listed in Compustat. *Geo Inverse Herf* is the inverse of a revenue-based Herfindahl index on the firm's geographic segments. *% Largest Cust* is the percentage of firm sales comprised by the single largest customer. *Assets* is firm assets and *Sales* is firm sales. *Tobin's q* is defined the market value of equity plus the book value of assets less the book value of equity and deferred taxes divided by the book value of equity. *ROA* is EBITDA less Dep & Amort divided by Net PPE and Current Assets. *% Neg CF Segs* is the percentage of business segments with negative operating profit before depreciation. *Debt to Assets* is total debt to assets. *ln(Firm Age)* is the natural log of firm age, which is defined as the earliest firm observation available in either Compustat or CRSP. *Excess Seg Lev* is the amount of leverage taken on by the multi-segment firm in excess of single-segment firms in the same industry. The measure is defined in Berger and Ofek (1995) as

$$\text{Excess Leverage} = \frac{DEBT}{ASSETS} - \sum_{j=1}^{n} \frac{ASSETS_j}{ASSETS} \times \frac{DEBT_j^{SS}}{ASSETS_j^{SS}}$$

Excess ICF is excess internal cash flow and *Excess NEC* is excess net external capital. Both measures are defined in Peyer (2002) as

$$\text{Excess Net External Capital} = \frac{Net\ External\ Capital_t - \sum_{j=1}^{n} SALE_{j,t} \times \left(\frac{Net\ External\ Capital_{j,t}^{SS}}{SALE_{j,t}^{SS}}\right)}{ASSETS_{t-1}} \quad \text{Excess Internal Cash Flow} = \frac{Internal\ Cash\ Flow_t - \sum_{j=1}^{n} SALE_{j,t} \times \left(\frac{Internal\ Cash\ Flow_{j,t}^{SS}}{SALE_{j,t}^{SS}}\right)}{ASSETS_{t-1}}$$

KZIndex is the Kaplan-Zingales index defined in Lamont, Polk, and Saa-Requejo (2001). *Residual Variance* is the variance of net-of-market returns for a given year. ***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively.

	Small Focused Firms			Small Diversified Firms			Difference	
Variable	**N**	**Mean**	**Median**	**N**	**Mean**	**Median**	**T Stat**	**Z Stat**
Excess Value (fitted q)	21,186	0.31	0.19	1,362	-0.06	-0.17	17.31***	17.68***
Excess Value (median q)	21,186	0.19	0.12	1,362	0.08	-0.03	6.86***	7.17***
RVA	21,186	0.0000	0.0000	1,362	-0.0015	-0.0000	15.17***	4.41***
CF Sensitivity	21,186	0.0000	0.0000	1,362	-0.0003	-0.0000	3.27***	7.33***
CAPX to Sales	21,186	1.70	0.05	1,362	0.20	0.04	1.33	7.41***
# of Bus Segments	21,186	1.00	1.00	1,362	2.27	2.00	319.99***	150.11***
Bus Inverse Herf	21,186	1.00	1.00	1,362	1.70	1.70	235.46***	150.06***
# of Geo Segments	21,186	1.98	2.00	1,362	1.96	2.00	1.68*	1.73*
Geo Inverse Herf	21,186	1.05	1.00	1,362	1.06	1.00	1.63	0.39
% Largest Cust	21,186	0.02	0.00	1,362	0.03	0.00	4.01***	7.02***
Assets	21,186	13.92	7.48	1,362	11.68	7.94	3.39***	3.43***
Sales	21,186	8.03	6.36	1,362	10.74	10.02	14.75***	16.50***
Tobin's Q	21,186	2.30	1.74	1,362	1.85	1.35	10.67***	11.35***
ROA	21,186	-0.23	-0.06	1,362	-0.07	0.01	6.34***	11.67***
% Neg CF Segs	21,186	0.50	1.00	1,362	0.32	0.33	13.09***	12.43***
ln(FirmAge)	21,186	1.81	1.79	1,362	2.16	2.20	17.25***	17.05***
K-Z Index	21,186	-14.61	0.18	1,362	2.78	0.96	3.02**	10.94***
Excess ICF	21,186	-0.19	-0.03	1,362	-0.06	0.01	8.73***	9.82***
Debt to Assets	21,186	0.49	0.41	1,362	0.61	0.53	7.93***	14.52***
Excess Seg Lev	21,186	0.01	-0.07	1,362	0.09	0.04	6.96***	12.05***
Excess NEC	9,579	0.45	0.01	673	0.13	0.00	6.59***	6.61***
Residual Variance	18,527	0.0036	0.0023	1,202	0.0036	0.0021	0.36	1.43

TABLE 5
Large Diversified Firms v. Small Diversified Firms

Univariate statistics for 11,140 diversified firms from 1978-1997. *Excess value* is defined by Lang and Stulz (1994) as

$$\text{Excess Value} = \log q - \log \sum_{i=1}^{n} w_i q_i$$

where the imputed q is either fitted using OLS regressions or using the median of the narrowest 4-digit, 3-digit, or 2-digit industry that yields five firms. *RVA* and *CF Sensitivity* are defined by Rajan, Servaes, and Zingales (2000) and Peyer and Shivdasani (2001) as

$$\text{RVA} = \sum_{j=1}^{n} \frac{SALE_j}{SALE}(q_j - \bar{q})\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}} - \sum_{j=1}^{n} w_j\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}}\right)\right) \quad \text{CF Sensitivity} = \sum_{j=1}^{n} \frac{SALE_j}{SALE}(cf_j - \overline{cf})\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX}{SALE}\right)$$

Small firms are defined as those with sales of less than or equal to $20 M in sales (1986 dollars). *CAPX to Sales* is firm capital expenditures divided by firm sales. *# Bus Segments* is the number of business segments listed in Compustat. *Bus Inverse Herf* is the inverse of a revenue-based Herfindahl index on the firm's business segments. *# Geo Segments* is the number of geographic segments listed in Compustat. *Geo Inverse Herf* is the inverse of a revenue-based Herfindahl index on the firm's geographic segments. *% Largest Cust* is the percentage of firm sales comprised by the single largest customer. *Assets* is firm assets and *Sales* is firm sales. *Tobin's q* is defined the market value of equity plus the book value of assets less the book value of equity and deferred taxes divided by the book value of equity. *ROA* is EBITDA less Dep & Amort divided by Net PPE and Current Assets. *% Neg CF Segs* is the percentage of business segments with negative operating profit before depreciation. *Debt to Assets* is total debt to assets. *ln(Firm Age)* is the natural log of firm age, which is defined as the earliest firm observation available in either Compustat or CRSP. *Excess Seg Lev* is the amount of leverage taken on by the multi-segment firm in excess of single-segment firms in the same industry. The measure is defined in Berger and Ofek (1995) as

$$\text{Excess Leverage} = \frac{DEBT}{ASSETS} - \sum_{j=1}^{n} \frac{ASSETS_j}{ASSETS} \times \frac{DEBT_j^{SS}}{ASSETS_j^{SS}}$$

Excess ICF is excess internal cash flow and *Excess NEC* is excess net external capital. Both measures are defined in Peyer (2002) as

$$\text{Excess Net External Capital} = \frac{Net\ External\ Capital_t - \sum_{j=1}^{n} SALE_{j,t} \times \left(\frac{Net\ External\ Capital_{j,t}^{SS}}{SALE_{j,t}^{SS}}\right)}{ASSETS_{t-1}} \quad \text{Excess Internal Cash Flow} = \frac{Internal\ Cash\ Flow_t - \sum_{j=1}^{n} SALE_{j,t} \times \left(\frac{Internal\ Cash\ Flow_{j,t}^{SS}}{SALE_{j,t}^{SS}}\right)}{ASSETS_{t-1}}$$

KZIndex is the Kaplan-Zingales index defined in Lamont, Polk, and Saa-Requejo (2001). *Residual Variance* is the variance of net-of-market returns for a given year. ***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively.

	Large Diversified Firms			Small Diversified Firms			Difference	
Variable	**N**	**Mean**	**Median**	**N**	**Mean**	**Median**	**T Stat**	**Z Stat**
Excess Value (fitted q)	9,778	-0.20	-0.22	1,362	-0.06	-0.17	13.21***	4.06***
Excess Value (median q)	9,778	-0.04	-0.06	1,362	0.08	-0.03	10.81***	4.19***
RVA	9,778	-0.0009	-0.0001	1,362	-0.0015	-0.0000	2.13**	0.28
CF Sensitivity	9,778	0.0016	0.0001	1,362	-0.0003	-0.0000	7.29***	10.23***
CAPX to Sales	9,778	0.08	0.04	1,362	0.20	0.04	8.86***	4.01***
# of Bus Segments	9,778	2.72	2.00	1,362	2.27	2.00	16.95***	18.12***
Bus Inverse Herf	9,778	1.96	1.83	1,362	1.70	1.70	13.71***	11.39***
# of Geo Segments	9,778	2.26	2.00	1,362	1.96	2.00	16.93***	17.53***
Geo Inverse Herf	9,778	1.27	1.00	1,362	1.06	1.00	15.95***	13.04***
% Largest Cust	9,778	0.02	0.00	1,362	0.03	0.00	5.21***	0.59
Assets	9,778	1513.27	245.19	1,362	11.68	7.94	13.31***	57.02***
Sales	9,778	1459.91	307.30	1,362	10.74	10.02	13.62***	59.67***
Tobin's Q	9,778	1.33	1.15	1,362	1.85	1.35	24.14***	11.02***
ROA	9,778	0.10	0.11	1,362	-0.07	0.01	39.70***	26.70***
% Neg CF Segs	9,778	0.09	0.00	1,362	0.32	0.33	38.36***	30.98***
ln(FirmAge)	9,778	2.95	3.14	1,362	2.16	2.20	33.76***	33.11***
K-Z Index	9,778	-0.27	-0.24	1,362	2.78	0.96	0.76	19.46***
Excess ICF	9,778	0.07	0.07	1,362	-0.06	0.01	26.05***	18.97***
Debt to Assets	9,778	0.58	0.57	1,362	0.61	0.53	2.90***	4.75***
Excess Seg Lev	9,778	0.06	0.04	1,362	0.09	0.04	4.96***	0.13
Excess NEC	4,309	-0.01	-0.04	673	0.13	0.00	10.80***	7.77***
Residual Variance	9,456	0.0010	0.0005	1,202	0.0036	0.0021	37.43***	38.23***

TABLE 6
Resource Allocation, External Capital, and Firm Complexity

Internal capital market efficiency regressions for 11,140 diversified firms from 1978-1997. The dependent variable is *Relative Value by Allocation* defined by Rajan, Servaes, and Zingales (2000) as:

$$\text{RVA} = \sum_{j=1}^{n} \frac{SALE_j}{SALE}(q_j - \bar{q})\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}} - \sum_{j=1}^{n} w_j\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}}\right)\right)$$

Small firms are defined as those with sales of less than or equal to $20 M in sales (1986 dollars). *CAPX to Sales* is firm capital expenditures divided by firm sales. *# Bus Segments* is the number of business segments listed in Compustat. *Bus # Geo Segments* is the number of geographic segments listed in Compustat. *ln(Sales)* is the natural log of firm sales. *ROA* is EBITDA less Dep & Amort divided by Net PPE and Current Assets. *ln(Firm Age)* is the natural log of firm age, which is defined as the earliest firm observation available in either Compustat or CRSP. *Excess Seg Lev* is the amount of leverage taken on by the multi-segment firm in excess of single-segment firms in the same industry. The measure is defined in Berger and Ofek (1995) as

$$\text{Excess Leverage} = \frac{DEBT}{ASSETS} - \sum_{j=1}^{n} \frac{ASSETS_j}{ASSETS} \times \frac{DEBT_j^{SS}}{ASSETS_j^{SS}}$$

Excess NEC is excess net external capital is defined in Peyer (2002) as

$$\text{Excess Net External Capital} = \frac{Net\ External\ Capital_t - \sum_{j=1}^{n} SALE_{j,t} \times \left(\frac{Net\ External\ Capital_{j,t}^{SS}}{SALE_{j,t}^{SS}}\right)}{ASSETS_{t-1}}$$

Industry dummies are created using the 48 industry classifications in Fama and French (1997). ***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively.

	Model 1		Model 2		Model 3		Model 4	
	Parameter	T stat	Parameter	T stat	Parameter	T stat	Parameter	T stat
Intercept	-0.0026	5.40***	-0.0028	3.72***	-0.0047	4.26***	-0.0034	4.25***
Small	0.0001	0.09	0.0009	2.32**	0.0012	2.09**	0.0021	1.26
# of Bus Segments	-0.0003	2.52**	-0.0003	2.41**	-0.0003	1.49	-0.0003	2.50**
Small x # of Bus Segments	0.0004	0.75						
Excess Seg Lev			-0.0004	0.71				
Small x Excess Seg Lev			0.0020	2.34**				
Excess NEC					-0.0015	2.08**		
Small x Excess NEC					0.0017	1.67*		
# of Geo Segments							0.0004	2.41**
Small x # of Geo Segments							-0.0006	0.70
CAPX to Sales	-0.0006	3.07***	-0.0006	2.59***	-0.0003	1.29	-0.0006	2.64***
ROA	0.0037	4.95***	0.0036	4.56***	0.0026	2.18**	0.0034	4.42***
ln(Sales)	0.0002	3.07***	0.0002	3.20***	0.0002	1.66*	0.0002	2.14**
ln(FirmAge)	0.0003	2.22**	0.0002	1.42	0.0007	3.09***	0.0002	1.53
Industry Dummies	No		Yes		Yes		Yes	
N	11,140		11,140		4,982		11,140	
R-squared	0.0068		0.0156		0.0286		0.0156	

TABLE 7
Excess Value, External Capital, and Firm Complexity

Excess value regressions for 11,140 diversified firms from 1978-1997. The dependent variable is *Excess value* is defined by Lang and Stulz (1994) as

$$\text{Excess Value} = \log q - \log \sum_{i=1}^{n} w_i q_i$$

where the imputed q is fitted using OLS regressions *RVA* is defined by Rajan, Servaes, and Zingales (2000) as

$$\text{RVA} = \sum_{j=1}^{n} \frac{SALE_j}{SALE} (q_j - \bar{q}) \left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}} - \sum_{j=1}^{n} w_j \left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}} \right) \right)$$

Small firms are defined as those with sales of less than or equal to $20 M in sales (1986 dollars). *CAPX to Sales* is firm capital expenditures divided by firm sales. *# Bus Segments* is the number of business segments listed in Compustat. *# Geo Segments* is the number of geographic segments listed in Compustat. *ln(Sales)* is the natural log of firm sales. *ROA* is EBITDA less Dep & Amort divided by Net PPE and Current Assets. *ln(Firm Age)* is the natural log of firm age, which is defined as the earliest firm observation available in either Compustat or CRSP. *Excess Seg Lev* is the amount of leverage taken on by the multi-segment firm in excess of single-segment firms in the same industry. The measure is defined in Berger and Ofek (1995) as

$$\text{Excess Leverage} = \frac{DEBT}{ASSETS} - \sum_{j=1}^{n} \frac{ASSETS_j}{ASSETS} \times \frac{DEBT_j^{SS}}{ASSETS_j^{SS}}$$

Excess NEC is excess net external capital is defined in Peyer (2002) as

$$\text{Excess Net External Capital} = \frac{\textit{Net External Capital}_t - \sum_{j=1}^{n} SALE_{j,t} \times \left(\frac{\textit{Net External Capital}_{j,t}^{SS}}{SALE_{j,t}^{SS}} \right)}{ASSETS_{t-1}}$$

Industry dummies are created using the 48 industry classifications in Fama and French (1997). ***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively.

	Model 1		Model 2		Model 3		Model 4	
	Parameter	T stat	Parameter	T stat	Parameter	T stat	Parameter	T stat
Intercept	-0.15	8.34***	-0.03	1.04	-0.05	1.27	-0.04	1.29
Small	0.15	10.59***	0.11	7.81***	0.14	7.13***	0.23	3.78***
# of Bus Segments	-0.03	7.06***	-0.02	5.99***	-0.02	3.84***	-0.02	5.96***
RVA	0.79	2.26**	0.79	2.31**	0.53	1.11	0.85	2.49**
Excess Seg Lev			0.07	3.69***				
Small x Excess Seg Lev			0.25	8.09***				
Excess NEC					0.12	5.08***		
Small x Excess NEC					0.16	4.94***		
# of Geo Segments							0.01	2.22**
Small x # of Geo Segments							-0.05	1.72*
CAPX to Sales	0.06	7.37***	0.05	6.93***	0.05	5.29***	0.05	6.81***
ROA	-0.54	19.83***	-0.47	16.53***	-0.53	13.24***	-0.55	20.03***
ln(Sales)	0.04	15.88***	0.03	11.98***	0.03	9.08***	0.03	11.08***
ln(FirmAge)	-0.06	11.65***	-0.06	11.80***	-0.05	6.52***	-0.06	11.36***
Industry Dummies	No		Yes		Yes		Yes	
N	11,140		11,140		4,982		11,140	
R-squared	0.0734		0.1249		0.1715		0.1127	

TABLE 8
Excess Value, the Small Firm Effect, and Measures of Asymmetric Information

Excess value regressions for 11,140 diversified firms from 1978-1997. The dependent variable is *Excess value* is defined by Lang and Stulz (1994) as

$$\text{Excess Value} = \log q - \log \sum_{i=1}^{n} w_i q_i$$

where the imputed q is fitted using OLS regressions *RVA* is defined by Rajan, Servaes, and Zingales (2000) as

$$\text{RVA} = \sum_{j=1}^{n} \frac{SALE_j}{SALE}(q_j - \bar{q})\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}} - \sum_{j=1}^{n} w_j\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}}\right)\right)$$

Small firms are defined as those with sales of less than or equal to $20 M in sales (1986 dollars). *CAPX to Sales* is firm capital expenditures divided by firm sales. *# Bus Segments* is the number of business segments listed in Compustat. *ln(Sales)* is the natural log of firm sales. *ROA* is EBITDA less Dep & Amort divided by Net PPE and Current Assets. *Debt to Assets* is total debt to assets. *ln(Firm Age)* is the natural log of firm age, which is defined as the earliest firm observation available in either Compustat or CRSP. *Residual Variance* is the variance of net-of-market returns for a given year. *Industry dummies* are created using the 48 industry classifications in Fama and French (1997). ***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively.

	Model 1		Model 2	
	Parameter	T stat	Parameter	T stat
Intercept	-0.16	5.60***	-0.02	0.76
Small	0.13	7.21***	0.11	6.20***
# of Bus Segments	-0.02	5.98***	-0.02	5.52***
RVA	0.96	2.88***	0.92	2.64***
Debt to Assets	0.14	9.36***		
Small x Debt to Assets	0.00	0.10		
Residual Variance			-8.12	3.79***
Small x Residual Variance			9.44	2.94***
CAPX to Sales	0.05	6.92***	0.06	7.12***
ROA	0.01	0.36	-0.49	16.80***
Small x ROA	-0.79	20.99***		
ln(Sales)	0.03	10.06***	0.03	11.11***
ln(FirmAge)	-0.05	11.30***	-0.06	11.65***
Industry Dummies	Yes		Yes	
N	11,140		10,658	
R-squared	0.1267		0.1064	

TABLE 9

Resource Allocation, Financial Constraints, and Customer Power

Internal capital market efficiency regressions for 11,140 diversified firms from 1978-1997. The dependent variable is *Relative Value by Allocation* defined by Rajan, Servaes, and Zingales (2000) as:

$$\text{RVA} = \sum_{j=1}^{n} \frac{SALE_j}{SALE}(q_j - \bar{q})\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}} - \sum_{j=1}^{n} w_j\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}}\right)\right)$$

Small firms are defined as those with sales of less than or equal to $20 M in sales (1986 dollars). *CAPX to Sales* is firm capital expenditures divided by firm sales. *# Bus Segments* is the number of business segments listed in Compustat. *Tobin's q* is defined the market value of equity plus the book value of assets less the book value of equity and deferred taxes divided by the book value of equity. *ln(Sales)* is the natural log of firm sales. *ROA* is EBITDA less Dep & Amort divided by Net PPE and Current Assets. *ROA* is EBITDA less Dep & Amort divided by Net PPE and Current Assets. *ln(Firm Age)* is the natural log of firm age, which is defined as the earliest firm observation available in either Compustat or CRSP. *Excess ICF* is excess internal cash flow defined in Peyer (2002) as

$$\text{Excess Internal Cash Flow} = \frac{Internal\ Cash\ Flow_t - \sum_{j=1}^{n} SALE_{j,t} \times \left(\frac{Internal\ Cash\ Flow_{j,t}^{SS}}{SALE_{j,t}^{SS}}\right)}{ASSETS_{t-1}}$$

KZIndex is the Kaplan-Zingales index defined in Lamont, Polk, and Saa-Requejo (2001). *Residual Variance* is the variance of net-of-market returns for a given year. *Industry dummies* are created using the 48 industry classifications in Fama and French (1997). ***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively.

	Model 1 - RVA		Model 2 - CF Sens		Model 3 - RVA	
	Parameter	T stat	Parameter	T stat	Parameter	T stat
Intercept	-0.0028	3.72***	0.0006	0.89	-0.0028	3.72***
Small	0.0011	2.79***	-0.0004	1.14	0.0011	2.92***
# of Bus Segments	-0.0003	2.42**	0.0002	2.38**	-0.0003	2.44**
Excess ICF	0.0022	2.41**	0.0028	3.54***		
Small x Excess ICF	-0.0024	2.01**	0.0007	0.69		
% Largest Cust					0.0005	0.38
Small x % Largest Cust					-0.0038	1.30
CAPX to Sales	-0.0006	2.66***	-0.0004	2.00**	-0.0006	2.61***
ROA	0.0029	3.47***	0.0046	6.39***	0.0033	4.40***
ln(Sales)	0.0002	3.05***	0.0001	1.05	0.0002	3.23***
ln(FirmAge)	0.0002	1.43	-0.0001	0.51	0.0002	1.52
Industry Dummies	Yes		Yes		Yes	
N	11,140		11,140		11,140	
R-squared	0.0156		0.1250		0.0152	

TABLE 10
Excess Value, Financial Constraints, and Customer Power

Excess value regressions for 11,140 diversified firms from 1978-1997. The dependent variable is *Excess value* is defined by Lang and Stulz (1994) as

$$\text{Excess Value} = \log q - \log \sum_{i=1}^{n} w_i q_i$$

where the imputed q is fitted using OLS regressions. *RVA* is defined by Rajan, Servaes, and Zingales (2000) as

$$\text{RVA} = \sum_{j=1}^{n} \frac{SALE_j}{SALE}(q_j - \bar{q})\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}} - \sum_{j=1}^{n} w_j\left(\frac{CAPEX_j}{SALE_j} - \frac{CAPEX_j^{SS}}{SALE_j^{SS}}\right)\right)$$

Small firms are defined as those with sales of less than or equal to $20 M in sales (1986 dollars). *CAPX to Sales* is firm capital expenditures divided by firm sales. *# Bus Segments* is the number of business segments listed in Compustat. *Tobin's q* is defined the market value of equity plus the book value of assets less the book value of equity and deferred taxes divided by the book value of equity. *ln(Sales)* is the natural log of firm sales. *ROA* is EBITDA less Dep & Amort divided by Net PPE and Current Assets. *ROA* is EBITDA less Dep & Amort divided by Net PPE and Current Assets. *ln(Firm Age)* is the natural log of firm age, which is defined as the earliest firm observation available in either Compustat or CRSP. *Excess ICF* is excess internal cash flow defined in Peyer (2002) as

$$\text{Excess Internal Cash Flow} = \frac{Internal\ Cash\ Flow_t - \sum_{j=1}^{n} SALE_{j,t} \times \left(\frac{Internal\ Cash\ Flow_{j,t}^{SS}}{SALE_{j,t}^{SS}}\right)}{ASSETS_{t-1}}$$

KZIndex is the Kaplan-Zingales index defined in Lamont, Polk, and Saa-Requejo (2001). *Residual Variance* is the variance of net-of-market returns for a given year. *Industry dummies* are created using the 48 industry classifications in Fama and French (1997). ***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively.

	Model 1		Model 2		Model 3	
	Parameter	T stat	Parameter	T stat	Parameter	T stat
Intercept	-0.04	1.31	-0.02	0.66	-0.01	0.44
Small	0.12	8.86***	0.13	9.20***	0.11	8.06***
# of Bus Segments	-0.02	6.06***	-0.02	5.88***	-0.02	5.90***
RVA	0.87	2.56**	0.86	2.51**	0.89	2.60***
Excess ICF	-0.08	2.54**				
Small x Excess ICF	-0.45	10.59***				
KZ Index			0.0000	1.20		
Small x KZ Index			0.0005	4.83***		
% Largest Cust					-0.14	2.71***
Small x % Largest Cust					0.52	4.91***
CAPX to Sales	0.05	6.44***	0.05	6.87***	0.05	6.94***
ROA	-0.36	11.96***	-0.54	19.78***	-0.55	20.14***
ln(Sales)	0.03	12.12***	0.03	12.68***	0.03	12.76***
ln(FirmAge)	-0.05	10.07***	-0.06	11.41***	-0.06	11.49***
Industry	Yes		Yes		Yes	
N	11,140		11,140		11,140	
R-squared	0.1371		0.1145		0.1142	